Industrial Finishing

Reg. U. S. Pat. Off.

Devoted to Product Finishing in the Factory

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THE FURNITURE FINISH OF 1934

NO. 45 RAPID COTE
NO. 50 RAPID COTE SEALER

—SPEED—

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FAST DRYING — DUST FREE 30 MINUTES
FAST RECOATING — 4 HOURS IF NECESSARY
FAST RUBBING — RUB AFTER 16 HOURS DRY

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EXTREME TOUGHNESS — ALCOHOL PROOF
EXCELLENT BODY — WATER PROOF
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ECONOMICAL — PRINT PROOF

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ONE COAT RAPID COTE SEALER—DRY 3 HOURS —SAND
ONE COAT #45 RAPID COTE—DRY OVERNIGHT OR RECOAT IN 4 HOURS
ONE COAT #45 RAPID COTE—DRY OVERNIGHT —RUB

GLIDDEN
EVERYWHERE ON EVERYTHING
PAINTS — VARNISHES — LACQUERS — ENAMELS
National Headquarters Cleveland, Ohio

Letters — from I. F. Readers

The names and addresses of those whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.—The Editor

Who Makes "Liquid Colophane"?

We would like to know the name of the manufacturer of a product called "Liquid Colophane."—A.B.C. Co.

Stove Paint — 500°F

We are looking for an enamel, lacquer, or any kind of paint that will stand up under 500° and 600°F. We intend to use it on a cheap stove; want to spray the body and the different parts. Could you refer this letter to some manufacturers, or advise us in order that we could get in touch with them regarding the above?—T.F.S. Co. (Stoves, Ranges, Heaters).

Red Stain Bleeds

We are having considerable trouble with our dark mahogany stain because it bleeds, therefore we are interested in receiving as soon as possible a non-bleeding, thoroughly-penetrating, dark mahogany stain which will dry very fast—that is within five hours if possible, so that we can go ahead and complete the article.

Our present toilet-seat finish consists of one coat of lacquer-base top coat, and two coats following that of nitrocellulose-base clear lacquer.—N.Q.C. Mfg. Co. (Toilet Seats).

What Finish Will Stand Boiling Water?

I have just learned of a company that manufactures a device on which is attached a thermometer for the purpose of determining the temperature to which an infant's nursery bottle is to be heated, etc. The product they are looking for, as a finish on this device, must be able to withstand constant immersion in water at temperatures up to 212°F. The metal from which the product is to be made will be brass, aluminum or sheet steel; ultimately they will probably use sheet steel.—L.C.A.

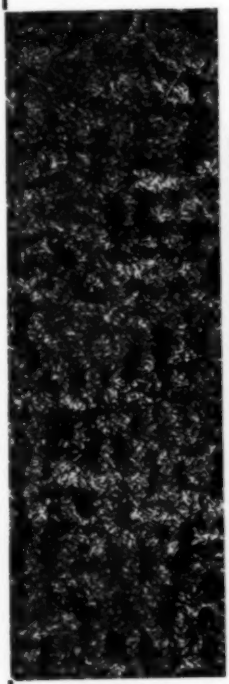
Camera Finishes

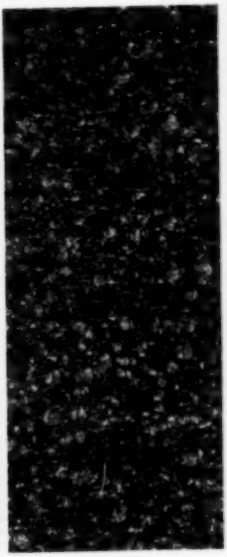
We would be glad if you could give us any information about the types of lacquers used, eg. alkide synthetic resin, cellulose, ester gum lacquer, cellulose dammar lacquer, shellac varnish or stoving oil japan finish for spraying and stoving (baking) photographic cameras in large quantities.

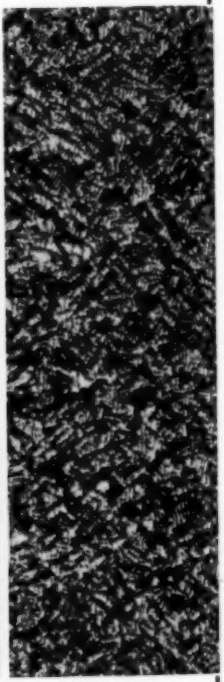
We need your information and experience to check up some reports we have regarding raw materials

One Coat Finishes

HILO







150 Shrivel Crystal Shrivel

Send for Color Cards

HILO VARNISH CORPORATION

"70 Years Experience"

HILO

42-60 Stewart Ave.
Brooklyn, N. Y.

Branches: Boston Chicago Philadelphia

offered to us as being extensively used in America for this purpose.—Thomas Howse Ltd., Quinton Works; Black Heath, Nr. Birmingham, England.

To Remove Gold Leaf and Plaster of Paris

I have four living room chairs that are solid walnut. They have been finished with plaster of Paris and gold leaf. My customer now wants me to finish them in walnut again. Is there any kind of process by which they can be washed off instead of scraping? If so I would like to know of it—R. D.

Wanted—A Product to Make

In our long experience in this work [the manufacture of certain machines and the development of certain processes] we have acquired well equipped laboratories, an organization of graduate engineers and chemists, our own resident patent department, factories in the United States, England and France, and a world-wide sales organization of graduate sales engineers.

Our success in developing new business . . . during the recent lean years, has made us aware of our own potential ability to develop markets for other equipment, and particularly our ability to develop and perfect processes for the use of such equipment. We feel that we are ideally equipped to take over a new product, either a machine or a process, complete the development work, improve the patent protection, and finance the manufacturing and selling of it. It has occurred to us that in your search for items of news for your publication you are constantly in touch with new ideas and developments, and that you could put us in touch with those who have need of a technically trained organization to handle all phases of a manufacturing and selling program.

We believe the product we would like is most apt to come from a trained technician and we would prefer not to take the time to investigate the hundreds of suggestions that might be made by men of inadequate technical training. Your contacts must of necessity be with just the people who have need of us. We would not be interested in household appliances, automobile accessories, or the like that sell in large quantities at a small unit price, unless of exceptional merit. We would prefer one that sells at a large unit price—one that has adequate patent protection, and one that commands a sufficient margin of profit to warrant the development cost. We would, for example, be interested in a new process for one of the process industries such as a new oil refining process. . . . Again, we would be interested in a new marine device that would sell for $1000 or more per unit.

Our company is not a large one but it is compact and is made up of young men. It has been successful in developing several machines and processes and it has sold them on a profitable basis. Can you assist us in finding a new machine or process? —X.Y.Z. Co.

Chemical Formulary in Demand

The Chemical Formulary, Volume I, the latest and most modern book of formulas and recipes for making thousands of commercial products is only three months old, having first been introduced at the Chemical Exposition. The interest which this work has aroused has been most gratifying. Already over 2000 copies have been distributed. It is being used by many manufacturers, sales managers, development executives, colleges, schools, public libraries, and others.

Chescheir to Cover 3 States for The Schaefer Co.

Russell Chescheir, of the Sun Varnish Co. joined The Schaefer Co., Louisville, Ky., manufacturers of varnishes, lacquers, etc., on February 1. Mr. Chescheir will travel the same territory that he has traveled for the Sun Varnish Co., namely, Southern Indiana, Kentucky and Tennessee. He is filling the post made vacant by the death in early January of Frank E. Nelson, who joined the Schaefer Co. about a year ago, after a number of years with the Louisville Varnish Co.

Progress Sales Meeting

The McDougall-Butler Co. Inc., (Paint, Varnish and Lacquer Makers) Buffalo, N. Y., held a two-day sales meeting at Hotel Buffalo on Feb. 23rd and 24th. Those in attendance were factory executives and representatives from Central and Eastern states, including managers of distributing houses controlled by the company. A discussion of industrial finishes, of which McDougall-Butler makes a very comprehensive line, was featured under the leadership of A. H. Gabel, Director of the Industrial Division. The sessions were presided over by Nelson M. Graves, Vice-President of the company.

It costs less to make your product better

★

For the sound reasons of quality and economy, leading manufacturers are modernizing their finishing departments by installing new and improved DeVilbiss Spray-Finishing and Exhaust Equipment.

Quality: DeVilbiss finishes improve the product's appearance, which means greater salability.

Economy: Production costs are lowered through faster, more efficient finishing operations.

To compete successfully under present conditions, the need for modernization is more urgent than ever before —modernization of equipment and of methods. The DeVilbiss Company offers you a complete modernization service for your finishing department.

Old-fashioned finishing methods or old-style spray-finishing equipment must be ruled out. Take the first step toward greater efficiency and lower costs by investigating the new developments in Spray-Finishing and Exhaust Equipment offered by DeVilbiss. Your local DeVilbiss representative can give you helpful suggestions and service in all matters concerning your finishing operations. Consult him now, or write us direct.

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New York Philadelphia Cleveland Detroit Chicago St. Louis San Francisco Windsor, Ontario

Direct sales and service representatives available everywhere

DeVilbiss

Why South Florida Exposure Tests? » »

by Earl M. De Noon
South Florida Test Service*

The two principal reasons are:

1) Natural sunlight of such constancy and value that it is probably impossible to duplicate it in any other part of the United States.

2) General conditions offer an ideal medium for atmospheric attack (in conjunction with sunlight) which accelerates the breakdown, but still gives the same type of failure which is found in inland communities throughout the sections of country outside of Southern Florida.

★ ★ ★ ★ ★

PREDETERMINING the life of finishes is of importance not only to the manufacturer but also the buyer. Questions which usually arise are: "How can we accurately determine durability and permanency of various materials or products?" and "Will the finish stand up in actual service?"

It has been said that outdoor tests cannot be reproduced with any degree of accuracy because the weather in any locality is never twice the same. Further, that a study of climatological data on any one location over a period of years indicates a marked variation from year to year. Analysis of conditions outside of southern Florida shows that this is true to some extent, but it does not apply to the area embracing Miami and the southern tip of Florida.

*Miami, Florida.

Actual Service vs. Artificial Tests.

By means of artificial accelerated laboratory methods the comparative merits of several finishes may be determined and the superior, average, and inferior materials classified, but the final results from such tests very often do not accurately portray actual service performance. The difficulty in establishing and controlling the conditions of accelerated laboratory tests so that a parallelism exists with a particular type of service is well known. Specimens are subjected to abnormal conditions which do not always exist in practice. The question to be answered is: "How long will it last in actual use?"

It has been pointed out that a month of artificial testing will produce results that require one year of roof exposure. A ratio of 1 to 12 is used in many cases. Experience has shown, however, that actual weathering tests may be conducted in South Florida in less than 90 days (extreme cases may require 120 days) duplicating at least one year of outdoor service

in typical northern localities. The majority of exposures develop much quicker—usually within the first 30 days. This is particularly true of fading in textiles, rusting through of plating on steel, and many paint and lacquer finishes. Materials that withstand more than four months continuous exposure in South Florida, and remain in perfect condition, may safely be guaranteed for long life in actual service outside of this area.

Research test field records show that, without the use of artificial light and heavy spray of any kind, rust on painted or plated metal surfaces has occurred in a few days. General exposures to atmospheric and sunlight attack have produced results in one week which would require months of northern outdoor exposure.

A recent exposure was made in comparison with an ultra violet arc lamp and actual sunlight tests. Artificially it required approximately 30 hours (at a distance of 10-in.) to obtain a certain degree of fading. Exposure to direct sunlight (not under glass) produced identical results in 11½ hours. (Test conducted in December 1933.)

All types of exposure tests may be conducted in South Florida under constant climatic conditions for 365 days in the year, year after year—a condition which does not exist in other sections of the country including northern Florida. Duplication of the effect of years of service in inland localities may be reproduced in remarkably short periods. The exact length of time required naturally depends upon the type of material or product to be tested and whether it is a superior or inferior item.

Weather Comparisons

The reasons for these exceptional exposure test possibilities are very clear. An interesting comparison of weather factors appears in the accompanying table (see bottom of page). The hours of sunshine by months range from 210 to 287—a remarkable constancy of sunshine throughout the year.

Space will not permit further detailed figures showing values and constancy of weather factors over long periods. Records of more than 35 years show little variation from the above figures for Miami. Needless to say, however, general conditions are sufficiently stable so as to be dependable and accurate.

Ultra Violet in the Sunlight

The importance of actual U.V. rays for exposure testing in connection with light fastness, etc., cannot be overlooked, and nothing has been perfected up to the present time to exactly duplicate sunlight. Studies and observations

	Miami	Chicago	New York
Mean temperature monthly	75.2	49.1	52
Mean temperature in December	68.6	28.9	35
Mean temperature in June	80.3	67.2	69
Hours of sunshine in December	217	113	148
Hours of sunshine in June	261	319	287
Hours of sunshine yearly	3008	2649	2680
Sunshine hours during 6 winter months	1370	934	1077
Hours of ultra violet light (in one year)	1750	540	X
Hours of ultra violet light (in December)	100	0	X
Hours of ultra violet light (in June)	200	154	X
Relative humidity; Average at 8 A.M.	78%	77%	74%
Relative humidity; Average at noon	66%	63%	59%
Relative humidity; Average at 8 P.M.	74%	69%	68%
Yearly rainfall in inches	60	33	43

X—Not given.

made by sun-ray research experts clearly indicate that the southeastern coast of Florida excels in the strength of the ultra violet ray. Atmospheric conditions are ideally suited for testing, being free from dust, smoke or gases, thus offering less resistance to the passage of the rays. Repeated tests show that the actual sunlight in South Florida is apparently 2½ times stronger than the artificial ray used by physicians.

Salt Air Conditions Negligible

It might be added that the salt air conditions are no worse than at any other coastal region; in fact, the location of all research test fields are sufficiently far enough away from the ocean to prevent actual salt water spray contact. The type of failures closely parallel those found in inland industrial and residential centers.

Practical Value of Tests

An example of the practical value of South Florida exposures may be found in the following cases.

1) It was desired to test several hundred automobile accessories to determine the differences, after actual exposure to weathering, between the plating on brass and similar formulas on steel. After 24 hours exposure 35% of the steel base samples showed evidence of rusting through. Six days after initial exposure 60% of the steel pieces showed definite rusting. The entire test was completed in less than 30 days.

2) Another actual case may be cited. A lacquered panel was sent to South Florida for standard exposure, and duplicate panels were subjected to northern exposure and artificial tests. The "A" panel was placed on test at Miami, "B" panel was placed on a roof in Erie, Pa., and the "C" panel was subjected to artificial weathering in a laboratory. All three panels were prepared in the same manner and with identical materials. The results were as follows:

"A"—Exposure made during the months of November and December; total exposure 35 days. Hours of sunshine during period of test, 257. "A" panel failed within the 35-day period. Luster failed; visible cracking and blistering occurred.

"B"—Exposure made during the same period at Erie. Total exposure, 35 days. Sunshine, 62 hours. "B" panel showed very slight checking under microscope; was in excellent condition generally. (This panel remained on exposure in Erie from November 1932, to December 1933, when point of failure was reached identical with panel exposed for 35 days in Miami.)

"C"—Exposure time for artificial weathering, 217 hours. Result: abnormal type of failure not conforming with "A" and "B", after actual service exposures as noted above.

Conclusion

The technical expert interested in durability of finishes whether to be used for indoor or outdoor use, will find much of value and interest in South Florida tests both from the standpoint of time-saving and accuracy. Experiments conducted with textiles, rubber flooring, window shade cloth, etc., by exposing these materials under glass to duplicate indoor use, have shown excellent results in the determination of durability and permanency.

During an exposure under glass,

samples receive more than 200 hours of sunshine every 30 days. Under normal ordinary use in a home, for example, it would require months, if not years, to obtain the same sunlight attack. Materials and products subjected direct to weathering in southern Florida include automotive, aeronautical and marine equipment, paints, lacquers and enamels, all kinds of painted and plated products, surgical instruments, etc.

Cleans Castings in a Big Way

MUCH interest is being aroused by the completed installation of new equipment at the Bucyrus-Erie Co., South Milwaukee, Wisc., designed to clean steel castings ranging in size from small gears to large revolving frames weighing 15 tons, by the application of water under pressure from 300 to 400 pounds per square inch.

Previously the core sand, core rods and gaggers from these steel castings were removed by a crew of men using pneumatically operated pokeout bars—a slow and dirty process involving many hours of tedious chipping and cutting. Now the same work is accomplished with only three men—the craneman, hookman and room operator—under conditions that eliminate all dust and dirt, and at a very great saving in time. A 15-ton casting, previously requiring about 35 hours to clean, now can be finished in from 1½ to 2 hours.

This casting washer was designed and built by the Pangborn Corporation of Hagerstown, Md., and consists of a steel room 25-ft. square on the inside and having an overall height from the floor level of 17-ft.9-in. Two front doors are operated by hydraulic cylinders and provide an opening 15-ft. wide and 16-ft. high for moving castings in and out of the room. An opening in the top of the room permits the use of a traveling crane in placing the work on the turntable in the center, and is a 3-panel, sliding-type door driven by a 5-hp. motor riding on the front panel.

A 12-ft. rotating table in the center of the room, fitted with 12 equally spaced T-slots, as well as a number of holes for stanchions, chains, etc., is used to hold the work. The turntable has a capacity of 50 tons and is operated by a 10-hp. waterproof motor. It may be rotated in either direction, to permit the stream of water to strike the work at the angle desired by the operator.

The two operating stations are located at one corner of the room, one above the other. Shatterproof windows located directly above the nozzles permit the operator to see the work in the room and to direct his nozzles where required. At both stations the operator has control of the water pump, movement of the rotary table and nozzles, and the interior lights.

As water is reused again and again, the consumption cost is very little.

"Tornesit"—from Hercules

"Tornesit" is a new product of the Hercules Powder Co., Wilmington, Dela., from which protective coatings can be made that are unusually resistant to acids and alkalies. Tornesit also has many other important merits of interest to chemists and paint and lacquer manufacturers.

The Union Pacific System's new, high-speed, light-weight, streamlined passenger train is attractive in color, too.

The New Streamlined Train's Decorative Color Effects

by Sterling B. McDonald
Art Director, S. Karpen & Bros.

The exterior of the train is painted a canary yellow, which is one of its peculiarly distinctive features. The canopied roof and the bottom of the train are painted a golden brown, the nose included—finished to the high gloss of the most expensive makes of automobiles. Between the yellow and the brown is a narrow stripe of red, which extends continuously the entire length of the train and accentuates the streamlining.

After a series of tests, Union Pacific officals selected the canary yellow color as an additional safety measure, as it can be seen for a greater distance than any other color.

THE DESIGN of the interior of the Union Pacific System's new streamlined train prompted the decorative color scheme and the method of its application. Since it is of light-weight construction, with polished aluminum bands and trim, a series of blue glazes was decided upon to enhance the form and to major in a color scheme composed of golden brown for the seat coverings, tans and light mauve in the window-shade material (that is interpretive of the Venetian blind or louver shade), deep raisin floor covering bordered with blue and tan, light walnut coloring in the cork tile, and lighter raisin in the lower part of the buffet.

The soffits or under-parts of the air ducts are painted a light but warm tan, divided into one or two small sections, and the first curved section of the ceiling is in a light French gray, both for beauty as well as light-reflecting qualities.

Immediately below this section, on either side, is a 2-in. convex band of polished aluminum, running horizontally the length of the car. The French gray and the light tan are lacquer, and the balance of the colors on the side walls are glazes.

The top section (just below the first aluminum band) is 6-in. in width and is a light gray-blue. The next band, a little wider, is slightly darker; the third value is the middle distance in the graduation of the five distinct shades, as the fourth and fifth values are stepped down in tones equal to the same degree of change that occurred from No. 3, as No. 2 and No. 1 are to both.

Each value is separated by an aluminum band 1-in. wide and 3/16-in. in relief—except values No. 4 and No. 5, which are separated from each other by the black Bakelite window sill or capping. The last section of the walls—that part which is from the bottom of the seat to the floor line—is in deep raisin opaque color.

All surfaces were first coated with a sealer and then followed two coats of the final color (for lacquer portions) applied by spray.

The sections later finished in glaze, were coated with aluminum bronze semi-gloss and non-absorbing. It was upon these surfaces that the blues were applied.

The glazes were mixed with raw linseed oil, turpentine and enough bolted whiting to give substance. Pure cobalt blue, ground in oil, was used in all of the five values.

The mixed color was applied the regular way by brush, except that it was put on as thin as possible. It was then mottled or "ragged" until very little pigment remained.

The next operation was to stipple it to an even texture and depth. This required the expertness of finished mechanics to obtain the oxidized metallic effect desired. Two coats of clear varnish were applied and rubbed to the finish of the polished metal. Any likelihood of the varnish later changing the quality of the blues was overcome by adding a little red to the glazing colors, but not enough to throw them away from the pure blue shades. The polish of the aluminum is protected by waxing.

The finish should not have to be disturbed by revarnishing or polishing for a good many years, as the aluminum bronze, being really metallic, and the lack of heavy pigment between them and the varnish, leaves little need for refinishing except in case of scratches. The cleaning process would be merely to wash with luke warm water in non-lye soap, and dry with clean cloths.

EDITOR'S NOTE: The author of this article was consultant on the interior designing and decorating of this new train, which was built by the Pullman Car & Mfg. Corp. All three aluminum alloy cars weigh only as much as a single Pullman sleeping car. A Winton, distillate-burning, internal-combustion engine of 600-hp. drives an electric generator which supplies current to the two geared axle motors on the front trucks.

Represents New England Lacquer Co. in Boston

The New England Lacquer Co., Providence, R. I., announces that R. W. Swett, 144 Brooks St., East Boston, Mass., has joined the organization as representative in the metropolitan Boston district. Mr. Swett is well acquainted in the leather trade, having been formerly actively engaged in this industry.

Designs, Colors, Finishes

in the Furniture Exhibited at the American Furniture Mart in Chicago

by Robt. G. Mudge

Outstanding Features:

The last word in Moderne, as it was displayed in the American Furniture Mart.

A 3-section davenport: By using the center section as a separate chair you may have a love seat.

Gas and electric kitchen ranges with built-in radio sets.

Folding furniture with many new features such as: the Wheelaway-Dinette.

A cupboard having five shelves . . . may be transformed into a dining room table for six people, without disturbing any of the dishes on the shelves.

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THE 1934 FURNITURE SHOW, which opened at the American Furniture Mart, Chicago, early in January, proved conclusively that it is possible for the American home to be comfortable, smart, elegant and at the same time quite thrifty. Ever since our architects turned wholeheartedly to modernistic designing at the World's Fair, the furniture horizon has been dotted with beautiful, contemporary and modernistic designs. They are not flashy in line—not of the harsh modernistic which had its boom several years back, only to fade out quickly because of its harshness.

Both the radical and conservative designs of modern furniture, modern fabrics and modern backgrounds, appear in sufficiently diverse array to satisfy the various tastes of the purchasing public.

Of course, there will always be customers for period designs, so the manufacturers are showing some Eighteenth Century English and French furniture. Much of this, I noticed, was in simplified form, that is, classic-modern based on the Directoire and Biedermeier lines.

In several displays I saw Early American designs which had been very effectively revamped, this being especially true in bedroom and dinette pieces.

Among the other prominent furniture periods I noted that Louis XV remains in high esteem among the higher priced bedroom styles. It seems to me that, as time goes on, this design is touched-up with more decorations and carvings. Maple pieces seem more popular than ever, with cherry and walnut following. Bright pillows of the newer modern designs are used to enliven many of these pieces. Painted furniture seems to have fallen off a little, although some of it appeared in several displays. White leather upholstering was much in view, and a good bit of trimming is being used. Leather is now being used in most of the fabric shades.

Coffee tables were as prominent as ever—many with the deflating

modernistic tendencies. One in particular, a circular table with a rounded back of wood, had a glass top supported by metal bars. The World's Fair, of course, is credited by all the manufacturers of modern styles as of great value in bringing about further acceptance of these newer designs.

Metal furniture is making great strides in the fashion line. Modern bedroom sets in golden yellow

trimmed in chromium were popular; also gray with small bands of bright trimming. In fact I believe the metal furniture (believe it or not) was more colorful than ever. While chromium remains the chief component for this type of furniture, several displays have used bronze and copper.

The industry, it seemed to me, has profited by its first "normal" market in several years; the uncertainty of the past few years seemed lacking. The entire industry is operating under the NRA code, and prices seem to be pretty well set. No upheaval, caused by the depression years, was evident and I think this of great importance to manufacturers, retail men and the public. An element of confidence not marked since 1930 seemed evident, indicating a smooth trend for 1934.

Finishing Walking Sticks

WOODEN WALKING sticks are too long to be given a satisfactory final finish by the tumbling process. I suggest dip-finishing. If the sticks are to be filled or sealed before they receive their finishing coat, it would be possible to apply same by tumbling, using some small wood turnings to serve as a means of spreading the filler or sealer around the surfaces of the walking sticks to produce a uniform coating. After the filled or sealed surfaces are thoroughly dry the sticks may be given a light sanding, after which they are ready for the dip-finishing operation.—J. E. Greene.

Filler Wiper

A letter from Oscar Smith & Sons Co., Philadelphia, Pa., on the above subject, outlines some of the merits of the company's product "Fillerub" as follows:

"Costs more than burlap, rags, excelsior, etc., but it keeps on doing the job, and doing it better, when burlap, etc., quit; retains its resiliency and bite when saturated with filler; will not litter floors, and it lasts four or five times as long; is in small, easily handled bales."

Hilo Re-elects Officers

At the annual meeting of Hilo Varnish Corporation, held at the Brooklyn Plant on Feb. 15, all of last year's directors were re-elected; also all the officers as follows:

Carl J. Schumann.....President
Albin G. Schumann.....V. Pres.
John H. Mills.....V. Pres.
Frank M. Schumann.....Treasurer
William L. Schwalb.....Secretary

Joseph Mattiello was elected director to fill a vacancy. Upon his graduation from The Brooklyn Polytechnic Institute, Mr. Mattiello came to Hilo where his efforts have been directed towards laboratory work. He was appointed Technical Director of the corporation last September.

Sales not so good?

- - - - Perhaps it's the finish!

IT'S fine and dandy to be able to work out a mess of jumbled sales figures to a neat, orderly arrangement showing which products are *selling* - - - and which are *not*. It's swell, too, to have up-to-the-minute sales data on tap - - - ready for the boss, on a moment's notice.

But of far greater importance, we think, is the ability to analyze and find out *why* your product hasn't reached its anticipated popularity. Obviously, it is necessary to know whether or not sales are lagging—but it is infinitely more vital to know *why*!

And you'll probably learn some very amazing things when you start poking around for information. For instance: You may find that though your product is perfect from a mechanical, or utility point-of-view the finish of your product is the leash that is holding back its sale.

That's our business - - - industrial finishing. And we've been at it for over fifty years.

A word to our office (mail, phone or telegram) will bring an Egyptian Finishing Expert who will gladly lend his assistance in the development of a new or better sales-building finish for your product. There is of course no obligation.

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A 1934 Model, 4-passenger, Stinson, Reliant cabin airplane. The fuselage is painted Diana cream; the darker color decoration is in Bonnet blue — set off on the sides with vermilion pin striping.

« Aircraft Finishing—I »

by M. W. Mason

A lacquer chemist, equipped with both laboratory and field experience, discusses aircraft finishing.

The various operations of fabric covering, doping, coloring off, lettering, patching, and repair finishing are dealt with. Some of the more common difficulties and causes of failures in aircraft finishes are mentioned. This series of articles also includes the general procedure for finishing a fabric-covered airship.

✪ ✪ ✪ ✪ ✪

ADVANCEMENT in the direction of higher speeds for aircraft has placed additional demands on both the materials employed and finishing procedures of the industry. It is now possible to cross this country from coast to coast in 16 to 20 hours. Only when we consider the various weather combinations it is possible for a 'plane to encounter, with the resulting effect on durability, are we impressed with the responsibility with which the finishing department is entrusted.

The following properties and conditions of exposure a ship meets in service are discussed as a means of explaining the purpose for the various steps required in aircraft finishing.

The properties of aircraft finishes may be divided into three separate groups. First, to offer protection against the elements, such as rain, wind and wide temperature variations. Second, to introduce mechanical properties such as strength and rigidity (tautness). Third, beauty and attractiveness.

Salt air and fog banks, found on both Atlantic and Pacific coasts, coupled with strong sunlight, have the property of producing a chalk-like film over the color coat. In most cases, this would actually be in the nature of a protective film were it not re-

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Corallac is lower priced than most sealers. And its exceptionally heavy solids content makes it a sensational value at this time. Don't overlook the further economy in reducer. Corallac may be thinned nearly half and half *with alcohol* for spray application.

But economy is not the whole story. Corrallac is a *quality* sealer for use under any finish. Equally suitable under lacquer and varnish of any type, especially the popular new synthetics.

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CHICAGO

moved. However, it detracts greatly from the appearance of a ship, as the gloss soon becomes completely destroyed and the color becomes dirty and chalky and finally is hidden. Of course, certain colors are more affected than others.

In order to restore the beauty of this ship, it is necessary to remove this chalk film with an abrasive polish, of which there are several good ones on the market. Continued application of abrasive polish will soon wear the color coats down to the clear dope. Where this happens, the area soon checks and requires refinishing; therefore, a reasonable amount of colored dope must be applied to take care of such future polishing, and owners should be instructed in the proper care of a finish.

Changes from damp to dry climates, cold temperatures, and strong sunlight have a tendency to make some finishes go brittle and cause cracking and checking. Clear and colored dopes of good quality are the best insurance against this type of failure.

High wind, hail, rain, etc., act like sandpaper on a finish. These impacts are of considerable velocity when we consider a ship traveling at a speed, say of 150 miles per hour and cutting through a head wind of some 30 miles. This is very pronounced in the case of the autogiro type ship. Here we have a rotor vane (windmill appearing device) the tips of which are traveling, in many cases, more than four miles per minute. Add to this your speed of 100 miles and a head wind of 30 miles an hour, and you see how essential good finishing really is. A perfect finishing job must be done on these vanes to have them withstand such terrific exposure.

Bumpy air and 'plane vibrations cause checking of a finish. This usually appears over edges and around tacked sections. Proper tacking, followed by good taping and doping, are necessary to overcome this condition.

Mechanical Properties

Aircraft finishes must impart very important mechanical properties to the surfaces. Those sections supporting the weight of the ship in particular need strengthening. This is accomplished by properly coating the surfaces with a special material which strengthens the fabric. The operation is called doping, and the material used is called dope.

The fabric, before finishing, has a bursting pressure of up to 120-lbs. per square inch. After the doping operation, this same fabric has been increased some 50% or more in strength. Besides strengthening the fabric, the clear dope shrinks the cloth to a marked degree, taking up all slack and imparting tautness to the fabric skin. Moisture rots fabric very quickly, therefore the cloth must receive ample protection in this regard. Clear dope impregnates and seals the fabric with a film that is waterproof.

Strong sunlight (ultra violet rays) break down the clear dope very rapidly, therefore a color coat must be used over the clear to protect it. The color coat is usually called pigmented dope. It has the property of filtering out these destructive rays of the sun, preventing them from passing through to the clear coat—to a certain extent.

So we have the clear dope protecting and strengthening the fabric, and the pigmented dope protecting the clear from

In ALCOHOL

as in ball bearings

...it's uniformity that counts

In determining the specific gravity to arrive at the "proof" of alcohol, the alcoholmeter is commonly used. The illustration shows a Rossville chemist using the more accurate pycnometer on a balance scale which is accurate to $\frac{1}{4,530,000}$ *of a pound.*

Like alcohol, ball bearings are seldom seen, but they carry a great responsibility. Standard bearings must not vary more than one-ten-thousandths of an inch, otherwise the larger balls would bear all the weight, and would soon crystallize and crush under the stain.

Ball bearings are made in different sizes and grades for different purposes. But all ball bearings for a particular purpose must be uniform in size and temper or they will not long operate with their intended smoothness.

Uniformity of a standard comparable to that required in ball bearings is characteristic of Rossville alcohols.

Exacting scientific control is exercised over each step in the production of Rossville alcohols, and every precaution is taken to the end that each shipment of each type of alcohol is an absolute duplicate of preceding consignments and of those which will follow.

There is a Rossville alcohol for every industrial, medicinal and scientific use---one which will exactly meet your requirements. The Rossville name is your guarantee of uniform quality. Rely on Rossville.

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breakdown from the sun rays.

The third property of the finish is beauty. Both the clear and pigmented dopes offer "build" to the surface, taking the appearance of fabric away—that is, these materials fill the pores and have sufficient fill to give a solid, metal-like effect. Suitable sanding and polishing operations afford a very smooth and attractive appearance to the surface.

Color Schemes

In selecting the color scheme for an airplane, easily distinguished and contrasting colors should always be given first consideration. At times ships are required to fly in restricted areas and close formation, therefore, colors that are easily seen offer an added factor of safety. Bright contrasting colors permit better detection of a ship from its surroundings and the clouds—and from an appearance standpoint they are more desirable than dull, dark combinations. Highly visible colors on wings are very helpful in locating a ship that has been forced down.

The dopes used in aircraft work are of two types, cellulose acetate and cellulose nitrate base. The cellulose acetate type has the merit of burning very slowly. The high cost of this dope and difficulties in its workability, however, have greatly restricted its use. The nitrate type is almost universally used.

Part II of this article, which will appear next month or later, deals with cleaning and finishing the structural metal and wood surfaces, and the application of dope coats to the fabric surfaces.

Many products in both wood and metal are now finished attractively and durably in a single sprayed or dipped coat of finishing material.

D H R ENAMELS AND UNDERCOATS

either in the oil or synthetic type, are made to meet the requirements of your finishing schedule. You may obtain them for Spraying, Brushing or Dipping and for either Air Drying or Baking. No matter which method you use you may be sure of complete and continued satisfaction.

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LIGHT *turns* LAGGARD!

ROAD SHAFTS of flashing light race through welcoming factory win-s. Surely they will put to rout any om inside. Yet they often fail.

Dust-covered ceilings catch and hold e of their brilliance. Gray, dirt-dged walls absorb the light. For s, mill owners have contributed sands of dollars to gray gloom. To-, however, science has done much ancel these payments.

Du Pont chemists have developed a ter finish for interior mill walls. A sh that stays whiter . . . resists yel-ing . . . sheds dust. Speeding light s *not* turn laggard when DULUX l White covers walls and ceilings.

his is an example of a definite serv-o industry, one of many in du Pont ory. In fact, in providing finishing erials of greater value, du Pont mists have been responsible for many of the major developments in finishes in the last ten years—DUCO for automobiles, DULUX Marine Finish for ships, Automotive DULUX for trucks, du Pont Finishes for furniture, radios, tractors, refrigerators, and other products of leading manufacturers.

You are almost sure to find one or more du Pont finishes to meet your needs perfectly. Specify them to protect your equipment against deterioration . . . and add to the value and salability of your products by increasing their durability and their beauty, too, if appearance is important. Rigid control of raw materials and manufacture and the system of du Pont Pre-Testing are assurance of uniform high quality month after month—year after year. E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Delaware.

FINISHES *for every industrial purpose*

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Finished Steel Interiors Highly Decorative

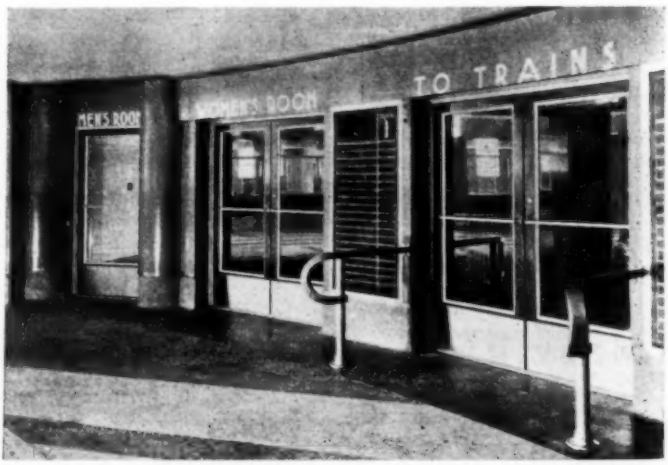
THE NEW RAILWAY station at Hamilton, Ontario, is attracting interested attention from architects and builders in both Canada and the United States because of the successful application of steel in the interior finishings of the building. The manufacture and installation of this equipment was by the Hollow-Metal Division of the Otis-Fensom Elevator Co., Ltd., Hamilton.

The wainscot, doors and frames, counter grilles, column coverings and walls are all steel. The walls are of No. 12 gauge steel, finished in baked enamel of a deep terra cotta color. The column coverings are also of steel, finished in bright aluminum enamel. All fastenings are concealed, and where two sheets of metal join, a small sunken head moulding is used at the joint. Curved walls and trim, extremely difficult to execute in steel, have here been handled successfully. Due to the heavy gauge of the metal used, there are no rolls and buckles, which were so characteristic of light gauge metal when used in large sheets.

The use of steel as a wall covering affords opportunities for an almost unlimited variety of treatments. Stenciling, transfer coloring, and etching, combined with the wide range of colored enamels, are a few of the possibilities.

While the conception of steel as a wall covering is not new, the realization of the idea has long been delayed. The Hamilton station is one of the first comprehensive installations of its kind and has aroused wide interest and comment.

The best and latest equipment is only so much junk—unless you know how to use it effectively and economically.



Interesting view in a new railway station showing use of modern decorative steel in interiors.

« Motor Boat Finishes »

as observed this year at the National Motor Boat Show

by George D. Hirst

THE 1934 PLEASURE boat season was officially launched in New York with the 29th annual National Motor Boat Show in Grand Central Palace from January 20 to 27.

Boats in the various exhibits covered every possible range of uses, from the vacation trip cruiser to the fast runabout. Also on display was an extensive array of paints, varnishes and compounds, marine engines and every boating accessory and gadget produced by the marine trade.

In size, the boats ranged up to the flagship of the Wheeler fleet, a 54-ft. twin-screw motor yacht, the largest craft exhibited at the show. Elco showed a complete line from 24 to 50-ft. in length. Keel and frame are of oak. In the larger boats, planking is cedar, copper riveted. The deck house, trunk and trim are mahogany. Decks are canvas, forward; varnished, aft. Metal work is bronze, brass and galvanized iron. The finish of the underbody is an anti-fouling compound. Top sides are white; decks, buff varnish.

The hull top sides of Richardson cruisabouts are painted flat white with a green arrow running parallel to sheer. Bottom is painted dark anti-fouling green. Superstructure and trim are of mahogany. Decks, cabin tops and canopy tops are of wood, canvas covered and painted green. Cockpit decks are painted battleship gray. Cockpit and deck house canopy are cedar covered with canvas and painted green, the underside being spar varnished. Coaming, windshield and window-frames, doors, handrails, cockpit sheathing, seat backs, transoms and all other woodwork is mahogany, spar varnished. All deck fittings are of bronze. Water tank is galvanized copper alloy. Faucets are nickel-plated.

Another Richardson, called the Junior, 28-ft. long, has its interior enamelled green; the exterior of the superstructure is stained and varnished.

A 16-ft. runabout is shown by Gar Wood. It is fully equipped with automobile-type instrument board, Spanish leather upholstery, nickel silver fittings, mahogany hull and shatter-proof glass windshield.

Many sailing craft were exhibited. Also a folding boat of ingenious construction to carry on a motor car, and an electric-propelled runabout. Another interesting exhibit was a 25-ft. auxiliary cruising sloop, the first craft of its kind to be constructed on a stock basis. It has a heavy iron keel, a 27½-ft. mast, a 16-hp., 4-cylinder motor, and a 3-berth cabin; steering is by tiller.

Dodge boats come with either painted sides or hulls of natural finish on the Philippine mahogany.

A new bronze boat-bottom paint in assorted colors was introduced. Full lines of marine paints and anti-fouling bottom compositions were shown by a half-dozen paint manufacturers. Various ship models were on display to demonstrate the many kinds of paints. Tests were made with salt and fresh water, ice and boiling water, to prove the durability and elasticity of various spar varnishes.

The general outlook for the business is somewhat clouded by economic conditions. Attendance at the show expressed in percentages showed considerable improvement over last year, but percentages are too vague a statistical basis to build on. There is no question that motor boating is a popular recreation and there is no question that its popularity is growing. But purchasing power for this form of luxury is lacking. Assuming improvement in conditions, greater standardization and better volume will result. Finishing technique will unquestionably receive greater attention as volume expands into really large mass production, and as prices are lowered. It is in that direction that this business is headed.

"Copper Powders" Paint Booklet

An interesting booklet on the subject of pure, metallic-leaf copper powders and copper alloy powders . . . and their uses in the paint industry, has been published for distribution by Van Dyke & Rice, Inc., 718 E. 16th St., Los Angeles, Calif., manufacturers of Cop-R-Cote paints for wood, metal and concrete surfaces.

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SHELLAC MIXING

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Only a few years ago it was generally assumed throughout the industry that shellac and lacquer could not be mixed. Exhaustive laboratory experiments revealed to Berry Brothers' chemists a means of accomplishing this feat. From this discovery came No. 448 Shellac Mixing—a waterproof primer and seal coat that is truly revolutionary. It is tough, waterproof and will not discolor—will not mar. Ten outstanding features recommend it for you:

1. Tougher than Lacquer Sealer
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Write for a list of users. No. 448 Shellac Mixing is not an experimental product. A bulletin giving detailed information will be mailed upon request.

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DETROIT, MICHIGAN WALKERVILLE, ONTARIO

Screen Process Painting

by Harry L. Hill

THE SILK SCREEN process has a definite field which is growing rapidly. It is not a difficult proposition, but, like any process or method from which the best results are to be secured, there are certain fundamental lines to be followed—and to follow them means the producer is practically sure to be pleased with the sales-appeal and the economic advantages accomplished.

In order that the fault or failure will not lie with the processor, it is advised that the beginner make his moves only after careful study of the work to be done, and then select the right process application for it. To this end I suggest a careful study of the several types of stencils (a silk screen is in reality a stencil) and the various methods for their use.

Silk, Organdie, Wire Cloth

The old-time cut-out stencils, with ties to hold them together, are rapidly being displaced by the open wood frames to which has been expertly fastened a fine mesh fabric of silk, cotton or wire. It may surprise some readers to learn that wire cloth can be obtained with a mesh comparative to very fine silk. This wire cloth, while not as generally used for a screen stencil production, is growing in favor.

It is poor policy to use a cheap grade of either fabric. In making purchases of silk or organdie, buy a good quality. The best organdie is never high in price, and silk should be purchased from a silk-screen supply dealer. The quality of silk used for this purpose is important. It is assumed that the average technical reader is already familiar with some of these fundamentals, hence no further detail is necessary here.

Every process that offers sales and production advantages has an assured place in the future of manufacturing; and the sooner and more pronounced is the demand for attractive merchandise, the sooner will be added to what we now call the "Silk Screen Process," the honors due it, for its value and for its rapid advancement.

A word or two about making the screen is quite in line, as this part of the equipment is by rights termed the foundation of the process. A well made frame means a frame carefully joined and squared and of sufficient over-size from the picture or design to allow squeegee room. Again, it is assumed that the reader knows the meaning of stretching taut the fabric while tacking it to the frame. The finished screen will have its fabric stretched to almost drum-head tightness.

Masking the Screen

As have passed the old stencil boards and metal stencils, so, to a great extent, have gone the brushed-in methods. The drop-black, shellac and castor-oil sealer

methods are obsolete. The reasons are obvious. Brushed-in work, as used today, is of higher order but not easily described; frequently it is a part of other methods. Lacquer paste, shellaced paper, sized paper, and patented film-like paper, represent the popular products now used. To this should be added the fast developing process of sensitized screens. This latter method expands the possibilities of the silk screen process, and it will be noted that operators thoroughly familiar with all processes are using sensitized screens in conjunction with other methods, just as the photo-engraver combines a halftone and a zinc etching or line drawing.

Halftone Effects

The best way to become familiar with sensitized screens is to first learn plenty about cut stencils. The object or results of using this method is the reproduction of the art in photographic detail. Properly handled, one can produce almost halftone effects, which it is hard to believe have resulted from forcing oil paint through a piece of fabric with a rubber squeegee.

Lacquer Sealers

Where brushed-in methods are employed, lacquers have taken the place of other sealers. They are superior in about every way. A big advantage is that the operator can make changes or corrections in the copy by erasing with a sponge or rag dampened with thinner. In sign jobs and other quick-delivery work, this is a distinct advantage.

Knife-Cut, Treated Paper

For real sharp work, where there is no photographic detail, the knife-cut stencil will answer all requirements. A good stencil cutter can produce exceptional results in design and in lettering and type—the latter as small as 30-point. However, it is wise and ordinarily good advertising to keep the lettered copy brief and sufficiently large to be easily read at a natural distance. For knife-cut work you have the choice of the papers mentioned.

Shellaced paper is used for many jobs—jobs for quick runs and for short runs, although the proper quality of paper will produce long runs. Vellum or tracing paper is used for the original drawing, and frequently used for tracing the design from the original. The paper carrying the design is given a coat of good shellac, and, when dry, it is cut with a sharp pointed knife. One should use a special stencil knife. When cutting this paper and other papers of like construction, watch the centers of the letters and design. As you cut them, place the centers aside and in proper order, so they can be properly and orderly replaced when the stencil is ready to be ironed to the screen.

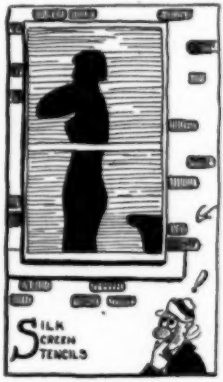
Other papers, with glue and composition coatings—especially such papers as are made by yourself—can be handled in about the same manner. These glue-and-composition coated papers (not the patented composition papers) are used largely in conjunction with lacquer paste. Shellaced paper is not practical for a stencil if lacquer is to be used instead of oil paint. Oil paint works well—splendid in fact.

The patented paper is very popular, and for general screen process purposes it is well nigh perfect; it is good for long runs, is easily handled, and is quite inexpensive when properly compared. It is not practical for use

with lacquer but is ideal when oil paint is used. This transparent paper-like material can be placed over the sketch and the stencils cut with utmost precision. By the use of this material, the registering of more than one color is made easy for the stencil operator.

Attaching Paper Masks

To attach any of the paper stencils to the fabric, merely place the shellaced or glue side of the stencil up and lay the fabric on it; then, with a hot flat iron working inside the frame, iron the fabric to the shellac or glue surface. Do this carefully and thoroughly. Centers and small pieces can be put in position by using the point of the iron.



Before attaching any substances to the screen, it is well to wet the fabric and let it dry thoroughly. Use good vellum or tracing paper. Trace carefully and cut carefully. If more than one color is to be run, you will probably need a screen for each color. If so, do your cutting and layout work by the same guide lines, and be equally careful when putting your screens in position.

Decorative Possibilities

Practice along all these lines is sure to convince you of the practical working qualities of silk screen production. Likewise it will give you the reasons why so many lines of industry are including it in their production. The evidence is all about us that the process is meeting favor through the art and color effects obtained. Lithographers, who for years frowned on the process, are now making use of the stencil method to handle not only their small runs, but to get color effects not otherwise obtainable. Furniture manufacturers, workers in etched glass, and other producers of large pieces and volume production are either using or making inquiries about the silk screen process.

Art and Design

Begin every job by having good art, whether it be design, lettering or other copy. Good art and good workmanship in the screens and their handling are very essential. Buy paint made especially for silk screen production, and do not be guided by price alone. This business has long since reached the point where the trade can be supplied by prominent and well established dealers.

A Dependable Workman

Last but not least, put your most dependable man on the job. Use a man who is eager to learn and willing to follow the tips and leads furnished by others having experience. Suggest that he follow the trade journals for articles on the subject, as it is being frequently discussed and new ideas are abundant. The silk screen process is well worth your time and experimenting if you have any need for manifold reproduction . . . on almost any product and almost any smooth or near-smooth surface. An authentic book on the silk screen process is also available.

Dry Filler Properly

THE FACT is not well understood nor realized that in drying filler it is absolutely essential that there be free circulation of air—or else the filler will not dry properly. The humidity also must be watched. Especially when used under lacquer, it is necessary that filler be bone dry before any coating is applied over it. If the surface is improperly dried after the filling operation, trouble is sure to result in the finishing. Nothing is gained by rushing through this most important operation, and much time and expense can be saved by carefully watching both humidity and air circulation.—C.F.S.

Finish users can now shift their worries to specialists—individuals or firms who go in for designing finishes, improving finishes, cutting finish cost, testing finishes, etc.

H. J. Goodyear Becomes Secretary-Treasurer of John Lucas & Co.

The election by the Board of Directors of Harry J. Goodyear, as Secretary and Treasurer of John Lucas & Co., Inc., Philadelphia, Pa., is announced by the company in a letter, wherein it is stated that Mr. Goodyear has earned this recognition through his initiative, loyalty and courage in meeting difficult problems.

Alsop Expands

The Alsop Engineering Corp., 39 W. 60th St., New York, N. Y., manufacturing Hy-Speed liquid processing equipment, reports that they have experienced such an upturn in the volume of orders in recent weeks that a considerable expansion in floor space has been necessitated. The additional space, 10,000-ft. of it, comprises an entire floor of the building now housing the corporation. Persons seeking demonstrations and tests now have a more complete and expansive showroom at their disposal.

This is the Emblem of Standard Quality in Finishes

METALLIC PYROXYLIN FINISHES

Our METALLIC PYROXYLIN ENAMELS produce a beautiful lustrous finish with excellent adhesion to most surfaces, and good coverage in one coat. Can be polished or buffed to obtain a higher lustre.

Can be furnished in: Gun Metal, Gold, Silver, Bronze, Brass, Copper, and various Pastel Shades.

Samples gladly furnished at your request. Write.

H. V. WALKER CO.

Elizabeth, New Jersey

Color, Imitation Wood, Pearl Essence, Metallic, Wrinkle, Feather, and Luminous Finishes for—

Concrete Burial Cases*—I

by E. Perry

A MANUFACTURER has asked for information about the latest finishes suitable for use on the exposed surfaces of concrete burial vaults. While I am not particularly familiar with burial vaults made of concrete, I do know something about the preparation and finishing of concrete surfaces, and I shall offer the following suggestions based on general principles of finishing similar surfaces which I assume may be smooth-cast concrete, and having in mind the character of decoration and appearance suitable to the occasion, i.e., of richness but decorum, having beauty and style but obviating gaudiness. And I should say that due to its type of construction material the finishing procedure should involve very careful preparation of the base with the view to prolonged durability of the finish during its period of display in warerooms and until the burial vault is purchased and utilized.

I would offer five kinds of finishes, namely: Pearl Essence, Metallic, Luminous, and Wood Imitation, all mainly lacquer-type coatings; and Wrinkle Finish using varnish-type coatings.

Case-harden the Surface

In this connection, the initial treatment of the base is quite essential to prevent deterioration of coatings generally caused by alkalinity, resulting in disintegration of prime coats, flaking off, and also discoloration. As alkalies are harmful practically only in the presence of moisture, it would seem advisable to first force-dry (as in a kiln) the concrete forms to bring the contained alkaline salts to the surface, where they may be acted on by chemical neutralizer and hardener.

The one material performing this dual service is the inexpensive chemical compound *Magnesium silico fluoride* (crystals) of approximate chemical formula $MgSiF_6.5H_2O$ readily obtainable from chemical supply houses. Its water solution is colorless and, when applied to concrete, it permanently transforms the cement into an insoluble granite-like substance, very much as steel is surface-hardened or case-hardened. It not

* In this article the author discusses and suggests finishes for concrete caskets, and also the vaults into which some caskets are placed.

only hardens, but it reduces the porosity of the surface by filling in the pores with a newly formed mineral which is considered to be neutral or non-reactive to paint coatings.

Application of the solution may be by any means to accomplish saturation, or as deep penetration as possible; then allow the same to dry out thoroughly. In the present instance dipping of the forms would be preferable if they can be so handled; otherwise the solution could be brushed or mopped on. Three applications are necessary, allowing 24 hours to elapse after each application, and the overnight drying out of the last coating.

The advised procedure is to first make up a 15% stock solution by dissolving 2½-lbs. of magnesium silico fluoride crystals to each gallon of water (hot or cold). The initial application for deep penetration will be a dilution of one part of the stock solution with two parts of water; the second application for normal depth of penetration would be half-and-half base solution and water; and the third application should be one part of base and one-half part of water, or the 15% solution may be used straight for the final surface hardening. It might be desirable to force dry the forms finally, if possible, to dry out all moisture before proceeding with the finishing work.

The primer coat ought to be, for additional precaution, and alkali-resisting lacquer of the newer types containing the alkali-resistant synthetic resins. Such products are advertised in INDUSTRIAL FINISHING, or the information supplied by the magazine. The next undercoating should be lacquer surfacer—as many coats as may be required to produce an even surface; or one may use an oil-type surfacer if desired. It should be wet-sanded, then dried. To effect a non-absorbent surface, apply a coat of sanding sealer. For this, one may use a coat of finishing lacquer as the sealer or ground coat over the sanded surfacer.

From this point the color work would proceed for any of the styles of finish, as follows:

Imitation Mahogany, Walnut

Apply a ground color coat of Venus natural copper. Over this, hand graining should be well executed with transparent graining color of a paint type. Tone down the ground coat for American walnut, or use a colored bronze, because natural copper powder is too brilliant for any other than mahogany graining. Copper powder may be glazed over the surface or, after the graining and first lacquer coat, the finisher can mist on a coat of walnut toning stain as in regular furniture shading.

Clear pale finishing lacquer would follow—in fact several coats of same to enhance the appearance of depth and clarity. The finishing lacquer should be properly thinned, and three or four double coats sprayed on. The application of several coats of lacquer with a high percentage of thinner is preferable to a fewer number of coats of a mixture containing less thinner. This has the tendency to reduce the liability to "orange peel." After final hardening the lacquered job may be dull-rubbed. Before rubbing, it is generally desirable to first mist-coat the surface to eliminate as much defect as possible and thereby facilitate a more beautiful rubbed finish.

A final coat of dull lacquer may be applied if desired. In that event,

I would suggest mixing clear gloss finishing lacquer (half-and-half, or more or less) to reduce the dullness, so to not detract from the ultimate effect. The most beautiful and natural effect I have ever seen in hand-grained imitation of crotch mahogany, was executed in just this way—using a reflecting ground of natural copper powder. It reproduced the scintillating life and satiny appearance of the finest San Domingo mahogany, an effect impossible by any other method of graining and ground.

Pearl Essence Finishes

This is perhaps the latest vogue in artistic effects. Undoubtedly the manufacturers of pearl essence advertising in INDUSTRIAL FINISHING, can offer many attractive combinations; also they can render good advice regarding the best practical procedure to follow in utilizing this material. However, as a general outline, I would present the following tentative suggestions.

Pearl essence would be the reflecting or luminous ground. This could be either the pearly stuff mixed into clear lacquer and applied as the undercoat, followed by a suitable transparent color-glaze coat on top; or the pearl essence could be mixed into a lacquer enamel to serve as a first coat. In most cases, probably, the enamel would have to be mixed first with a large amount of clear lacquer and thinned, in order to reduce the pigmentation and allow a transparent or translucent effect; otherwise the color would be too solid, and obscure the pearliness. Also, the quantity of pearl essence to be incorporated would probably be a variable amount according to prior trial and experimentation for each individual color combination.

Again, in wood staining, often times two or more applications of weak stain produce a clearer stained effect with more depth than does one application of concentrated stain; so in using lacquer containing pearl essence it might prove by trial that repeat coatings of lacquer containing only small amounts of pearl essence would enhance the desired effect, whereas more solid coatings would show too opaque.

Whether high-lighting should be done, and whether the high-lighting would show best immediately following or with clear lacquer coats between—this also must be determined through trial.

The final coatings would be the same as recommended in the first section here on Wood Finishes, viz: pale clear finishing lacquer for depth, rubbed, and if desired a last coat of modified dull finish.

Pearl finish in jet black makes an exceptionally rich appearance, and should be very appropriate for burial vaults. Although black in color, it is not sombre as might be presupposed; but instead it makes an unusually striking appearance which is really classy and beautiful. This jet black pearl finish is one of the newer attractions in artistic bathroom fittings, as may be seen in display rooms of The Standard Sanitary Mfg. Co. I would suggest leaving the finish almost a gloss, to avoid deadening the effectiveness which is so pronounced in a full gloss.

EDITOR'S NOTE: Next month the author will explain how to produce metallic finishes—dull statuary bronze, old silver, gun metal, etc. —baked wrinkle and feather finishes, and an interesting luminous finish.

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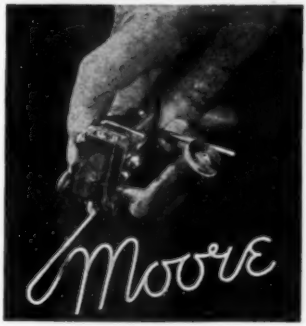

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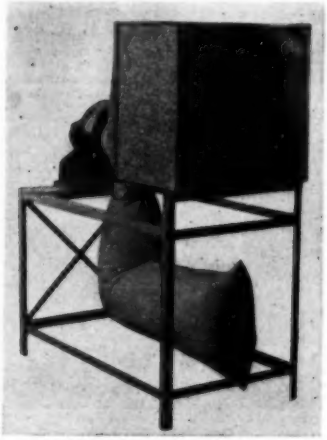
The Type XF Spray Booth is made of galvanized sheet steel with smooth interior and funnel shaped back leading to the blower unit. Booths are available in 2 or 3-ft. widths, with overall depth of 3-ft. and overall height of 5-ft. The floor is 33-in.



Convenient for spraying flock.

high and the depth is 18-in. An important feature of the spray booth is the provision for reclaiming excess material. The reclaiming bag is ample in size and of a special dust-proof fabric. It is detachable from the blower for easy cleaning and removing of material.

What's New « «

Non-Shrinkable Putty

A NEW WOOD putty named "Las-Stik," recently announced by the Las-Stik Mfg. Co., Hamilton, Ohio, will not shrink, or pull away from the surrounding wood—according to the manufacturer. The putty sticks like glue thus assuring a perfect bond between the product and the repaired part, whether used in repairing furniture, automobile bodies, pattern making or for other uses.

Las-Stik wood putty does not contain celluloid or other nitrocellulose products. It is made from real wood and a new synthetic resin, which has demonstrated its value as an outstanding plastic substance developed by modern chemical research.

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Polishing Machine

AS A RESULT of the demands for heavy duty polishing equipment, resulting from changes in the lacquer used in automobile body production plants, the R.G.Haskins Co., 4636 W. Fulton St., Chicago, Ill., has developed a heavy-duty, flexible-

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It is most economical in use. It stops spotting out. You can use the best without increasing your costs.

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East Berlin, Conn.

Lacquers Synthetics Enamels Japans

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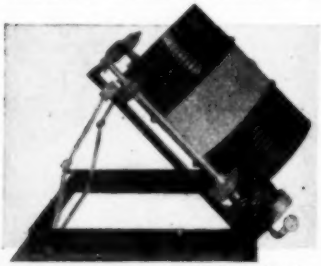
The overhead suspended model for convenience in reaching the top and side surfaces of finished products to be polished.

shaft polishing machine, type RG-5, powered by a heavy-duty, ¾-hp., air-jacket, totally-enclosed motor, 3500 rpm., with a new improved type non-stretching ½-in. diameter core and removable-type end casing, as well as a new heavy-duty 2 to 1 gear-reduction, right-angle head. This heavy-duty equipment will answer the most exacting requirements for rubbing and polishing of the glass-hard lacquered surfaces—according to the manufacturer.

Cleans Drum Interiors

HERE IS a small portable agitator and drum cleaner, "The Jiffy Cleaner," which rolls the drum in tilted position, as shown in the illustration, to clean the ends, and in horizontal position to clean the sides. The ¼-hp. motor (110-volt, 60-cycle, single-phase current) can be operated from an electric-light socket. Drum rotates 30-rpm. The drum's own weight keeps it in position while being rotated on rubber-covered rollers running on ball bearing shafts. A product of The Vol-U-Meter Co., Inc., (Engineers to the Liquid Handling Industry) 710 Ohio St., Buffalo, N. Y.



Operates in two positions — holding the drum tilted and horizontally.

M. G. Lindsay Joins Fred'k. A. Stresen-Reuter, Inc.

Fred'k. A. Stresen-Reuter, Inc., announces the addition of M. G. Lindsay to their sales force for the Chicago territory. Mr. Lindsay has been identified with the industrial trade for a number of years and is again associated with Mr. Theo. J. Adams, who is in charge of manufacturing for Fred'k. A. Stresen-Reuter, Inc. The company is now producing synthetic enamels, baking enamels, undercoats and specialties, in addition to the clear varnishes and japans, with which the Stresen-Reuter name has been associated for years.

Monsanto Chemical Co. Sales Increased 33%

The Monsanto Chemical Co., St. Louis, Mo., reports that its earnings for 1933 were the largest in the company's 30-year history. Earnings, after all charges, totalled $2,221,207 or $6.14 a share on the 432,000 shares outstanding. The Company's 1932 earnings were $1,012,698, or $2.37 a share. Bonuses were paid all employes.

In his letter to stockholders, Edgar Monsanto Queeny, President, states that one of the factors influencing the favorable 1933 earnings was the opportunity provided by the upturn in business for Monsanto to realize on the investment of approximately $9,000,000, which it had made during the past six years in a new and more efficient plant.

Monsanto sales for the year were 32.8% greater than in 1932. The percentage increase in those products entering into the textile, rubber, paint, and dyestuff industries was much larger, while many Monsanto products which find their outlet in the so-called heavy industries lagged behind the average.

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Operates from electric light socket and is furnished with vapor-proof or enclosed type motor, as desired. Propeller blade is nickel alloy aluminum. Height 46-in., weight 70 lbs., floor space 38-in. triangular. Price very reasonable.

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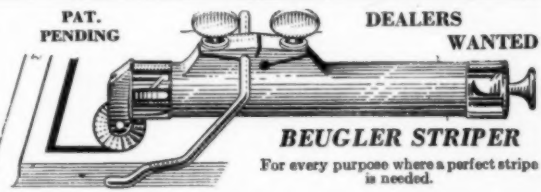

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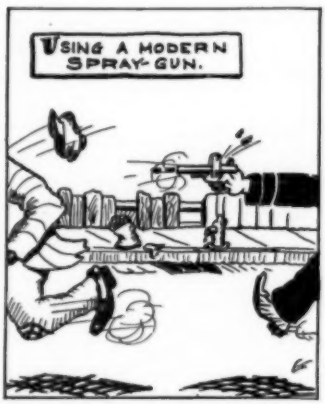
Questions «Answers

Baked White Enamel Flakes Off

We have recently experienced some difficulty in refinishing white enameled steel furniture. The original prime coat and enamel finishing coat were each baked at a temperature of 150°F. for two hours. Some of the stock which we have had on hand from six to twelve months requires refinishing before shipping to our customers, because after it has stood 8 to 12 months in our factory warehouse, the enamel begins to turn slightly yellow.

The refinishing procedure is to carefully sand the old enameled surface to thoroughly clean it and bring it to a uniform dull luster before the refinishing coat is applied. A refinishing enamel identical to the one originally put on, is used for refinishing. The material is sprayed on in the same thickness as the original finishing coat—after which it is oven baked at a temperature of 150°F. for two hours. This is the same baking temperature that was used on the original finish. After a period of two weeks to 30 days, following this refinishing operation, the enamel coating (including the original prime coat on the raw metal) begins to flake and peel off. What is the cause of this?—G. T. C. Co. (Mfrs. of Hospital and Medical Furniture.)



I think it is in the enamel; it lacks the proper vehicle to bind it. The baking of a piece of goods does not make it a certainty that it will stick. As for turning yellow, most whites will do that. The refinishing procedure has nothing to do with the finish chipping off. As the question is stated, the white, including the prime coat, comes off clear to the metal. This means something is the matter with the prime coat.

The prime coat has not enough oil in it. It is baked at 150°F. for two hours; then the enamel is put on and baked, after which the furniture is allowed to lay around for several months, which makes it more dry or brittle; then it is given another coat of the same white, and again baked at 150°F. for two hours. This then, in my opinion, is simply baking a piece of goods twice as long as it should be baked. Even so, it should not chip. A good white will stand four hours at 150°F. and "hang like sixty till the cows come home."

I suggest that another grade of finishing material a little longer in oil be used, or add a few drops of raw linseed oil to the white

you are now using. Your refinishing procedure is OK. A drop or two of blue in the enamel will tend to prevent it from turning yellow.

Some of the synthetic enamels, in my opinion, ought to do your job in one coat, and not turn yellow. They have wonderful tenacity and good body. I have in mind one brand of white enamel which is furnished either for air-drying or baking. I have used considerable of the baking enamel, and it is a wonderful material. It bakes at 175°F. for 1½ hours, and covers with a beautiful luster in one coat—and it is the toughest white I have ever seen.—FRED MANNHARDT (Finisher).

It appears to me that this may be a matter for the paint manufacturer to look into, though probably the fault may be elsewhere. But the mere fact that the white enamel has discolored to such an extent that refinishing is necessary suggests that inferior primer and enamel have been used. If that is the case, the enamel would most likely chip in any event—whether refinished or not, but an additional coat of enamel would hasten such chipping.

To check up on the original job I would take a piece of the original finished furniture from the warehouse, where it has been stored from 8 to 12 months, bake it at a temperature of 150°F. for two hours; then take it out and give it some rough usage to see if the finish will chip off. If it does the trouble is naturally in the original job, but not necessarily because of inferior paint or enamel.

It might be that the metal has not been properly cleaned before the priming coat. The cleaning process is a most important part of a faultless finish. If grease or any other foreign matter is left on

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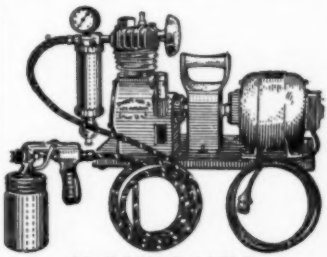

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the metal before the priming coat is applied, it will cause both discoloring and eventually chipping.

The condition of the air in the warehouse may also be a cause of the trouble. Dampness or acid fumes (even in small quantity) would naturally have a bad effect on the finish if the furniture were stored any great length of time.

I should be very much surprised if the trouble is in the refinishing coat (provided, identically the same enamel is used), as the proper procedure of sanding the old enamel surface to a dull finish, before applying the refinishing coat, has been followed.

Until the cause is definitely determined, I would advise putting the new metal furniture (before it is finished) through a caustic bath and clean the bare surfaces thoroughly with benzine before applying the primer and finishing enamel.—BAY NIELSEN (Finisher).

The reason the first finish on the hospital furniture turned slightly yellow after being in the warehouse over a period of time is: Either the enamel has been baked too long, or they didn't use a good grade of white enamel for the finishing coat.

The cause of the finish chipping, peeling and flaking off after being recoated is: The short life of the paint might indicate that the priming was too chalky, too short of oil or vehicle. Using poor primer for the foundation on the metal surface will cause checking and peeling off; also painting over loosely adhering mill scale, rust, blisters, grease, etc., or painting over a damp or wet surface.

This is my suggestion to overcome all this trouble:

First clean and sand all the pieces the usual way—or the best way is to use a series of cleaning tanks. I believe this will improve and help you to overcome your trouble. This means production and cleaner workmanship for the hospital furniture . . . before the original finish is put on.

After the furniture has been taken through the cleaning tanks and is thoroughly cleaned and wiped off with a clean cloth, apply a coat of high-heat white primer, and spray inside and outside of each piece. Bake at 300°F. for 2½ hours. After the baking process is done, sand each piece with No. 6/0 flint sandpaper, and dust the surface off with a clean cloth.

Now you are ready for the lacquer. Apply one coat of lacquer enamel, and be sure this material is sprayed on pretty wet so that when it dries it will leave a smooth and clean surface. I suggest not

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using a high-gloss lacquer enamel because it cheapens the appearance of the hospital furniture. By using this method, the finish will stand three or four years, before turning yellow.

There is one more method for finishing metal hospital furniture . . . by using synthetic enamels. This enamel can be purchased on the market, and can be used without any priming coat. Be sure the surface is free from all grease and dirt. Keep in mind that it always pays to purchase a better grade of synthetic enamels to obtain the best results.

Spray one coat of synthetic enamel, and bake two hours at 250°F. After baking, sand the surface with No. 6/0 flint sandpaper; then dust off with a clean cloth and apply the second coat of synthetic enamel and bake two hours at 250°F. Use the same enamel on the second coat as on the first coat. You will find this method will be more economical for larger production.—GEORGE MOSKOS (Finisher).

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Delivers a steady flow of clean air, free from oil, moisture or pulsations. *Write today for price and complete description of this latest development in portable spraying units.*

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« Compressed Air »

furnishes power for performing some cleaning, all spraying and numerous rubbing and polishing jobs in modern painting and finishing departments

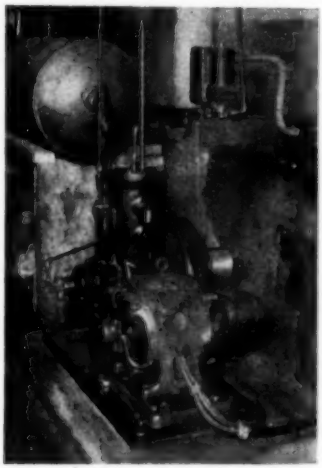
COMPRESSED air has become a necessity in practically all paint shops and finishing rooms, not only in industries where new products are manufactured but in refinishing shops too. First and most important, it supplies the force which makes the use of spray guns possible. Without compressed air there could be no such thing as spray finishing or sandblasting.

Other essential equipment dependent upon compressed air includes air dusters (air guns for blowing off dust from surfaces to be finished), air agitators for stirring materials about to be sprayed, air-powered rubbing and polishing machines, air lifts for raising and lowering large articles in the spray booth, and other air-powered apparatus inside and outside the finishing department.

Compressors, of course, take air at atmospheric pressure, pump it into drums or receivers wherein pressure is built up to anywhere from 25 to 125 or more pounds per square inch, and pipe lines deliver this compressed air to the service stations where it is used. An important accessory in connection with every air compressor and receiving tank is an automatic safety valve which releases air or cuts out the compressor power when the pressure reaches a certain predetermined amount.

Compressed air is very useful but it can also be very troublesome, and often the damage it does is wrongfully blamed onto finishing materials, spray guns, operators, surfaces being finished, the finishing room—everything or anything in fact but the real source of trouble. At service outlets compressed air should contain no excess moisture, oil, dirt or foreign matter whatsoever; but some or all of these objectionable contents are present in every air-compressor-pipe-line system—and they must be filtered out, not only at one point but at several points.

The mouth of the air intake pipe ahead of the compressor is usually screened and sometimes a moisture-collecting filter is also included in the



intake pipe. A drain valve is placed at the lowest point in the air receiver, and a moisture-oil-catching filter may be placed in the pipe line near the exit of the receiver and at the highest point in the pipe line system. But regardless of whether or not air-cleaning filters are installed at the points just mentioned, it is essential that one should be placed just ahead of the connection at each service outlet—particularly at each outlet to a spray gun. These filters should be cleaned thoroughly and frequently. Clean air is necessary for all operations in which compressed air is used, and every precaution should be taken to see that all air-cleaning devices are functioning at maximum efficiency continuously.

The size and type of compressor to select for any specified requirement or installation can best be determined by consulting a trained and experienced engineer or representative connected with a compressor concern that has furnished air compressors for similar installations. For all but the smallest outfits, a water-cooled compressor is preferred, and its rating in delivery of cubic feet of air per minute should be comfortably in excess of the maximum demand of present service requirements.

Devices and accessories other than those just named are generally found at one or more points in every compressed air installation; for example, air pressure gauges or indicators, reducing valves, air hose, material containers in which air pressure is used for forcing out material, and various kinds of connections and valves.

"Rust Preventative" Books

The Dearborn Chemical Co., 310 So. Michigan Ave., Chicago, Ill., has recently published two interesting and informative booklets (both profusely illustrated) which deal with the uses and possibilities of No-Ox-Id—a chemically compound rust preventive. One book entitled "Various Uses of No-Ox-Id" contains 20 pages 7½x9½ between the covers. The other, "Proof of Results With No-Ox-Id in the Railroad Field," contains 24 pages 8½x11 inside heavy covers.

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Rolls out perfect stripes — quickly and easily, greatly reducing costs of decorative striping. Even inexperienced help can use it. Every commodity manufacturer needs one. Try the "Lightning."

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EDITORIAL

Roll Call Results

Some interesting letters containing ideas to think about, have come to the editorial desk since the editor issued a Roll Call of former contributors who have not been heard from for a long time. Particularly striking are two paragraphs from a custom finisher in business for himself. He says:

"We also have called the Roll to see how many of our customers are still in business. The beginning of 1933 looked bad for our finishing business; 1932 was poor but after all, 1933 turned out to be a fairly good year, as there were just four of our customers—large manufacturers—that gave us large quantity contracts which kept our wheels turning. About 50% of our old customers are still lying dormant. We have kept in touch with our customers through occasional personal calls; these personal calls were responsible for our business in the past year.

"As I have stated before, we have taken space with a manufacturer of metal specialties. This concern has gotten out a new item to be placed on the market, and the finishing problem on this item was brought to me. The problem was solved by digging up an old copy of INDUSTRIAL FINISHING to find the address of a paint manufacturer that advertised a special novelty finish, which we are now using on this item."

Service with Sales

Taken in the aggregate, hundreds of thousands of dollars worth of new finishing materials and equipment are sold to thousands of small concerns scattered throughout all parts of the country. Owing to their very smallness, these buyers are frequently in need of more or less service following such sales—service in the form of instructions and information relative to the proper and efficient use of what they have purchased; and they are entitled to this service, because reputable concerns who sell them an initial order will expect to get repeat business.

That this matter is of more than ordinary importance is evidenced by a letter to the Editor from an experienced sales representative who sells a number of non-competitive lines in a section of eastern industrial territory. He says:

"When new materials or equipment are put on the market, more or less intensive pressure is used in channels where there is a likelihood of a promising field. The factory man is sent through a given territory, selling direct and giving service, with the idea of ultimately creating a market of sufficiently interesting proportions to a local jobber to persuade him to take on the account.

"From this point, the then user—if he has not been properly instructed in, or made sufficiently familiar with the problem of application—becomes more or less another 'forgotten man,' for the reason that the jobber salesman traveling the territory, or the store clerk with a catalog of items too numerous to permit his familiarizing himself with more than a limited number, is necessarily incapable of rendering the intelligent service so hopefully, as well as rightly, expected by the inquirer.

"The difficulties ensuing from improper recommendations hardly need elaboration, to say nothing of the fact that with this type of distribution, the jobber will not make an effort to sell unless he can pass his troubles along.

"The interested new prospect is also handicapped if he defers action to see what the acceptance of something new may be, for when he finally decides to buy equipment he lacks intelligent information, and he might be induced to install something which is inadequate for use in case of even a moderate increase in production—or so inflexible, if not worthless, that his reaction to finishing equipment is injurious to the industry in general. The same condition exists where improper recommendations are made as to the use of finishing materials that were never intended by the legitimate manufacturer for any such purpose—not only in the finishing shop, but for maintenance as well."

Here is something significant for users, manufacturers and distributors of finishing materials and equipment to think about. Obviously there exists a definite need for specific information about the proper use of all new products. Buyers and users should see to it that this information is forthcoming and then they should use what they have purchased according to instructions and recommendations. If trouble occurs they are then in position to demand and get a satisfactory adjustment from the concern that supplied the goods. A serious loss occurs to all concerned when a new prod-

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uct, or an established product, fails to make good through no fault of its own but because it has been improperly used due to the user's lack of information.

Joins H. V. Walker Company

Charles A. Barker has joined the staff of the H. V. Walker Company, Elizabeth, N. J., as sales and insulation engineer. Mr. Barker is widely known in the electrical and allied trades in the insulation field. He was formerly employed in a similar capacity by the Dupont Company.

Kenneth E. Burgess Joins Ault & Wiborg

Kenneth E. Burgess, formerly Technical Director of Zapon Co., but more recently in charge of the Lacquer Division of Van Schaack Bros. Chemical Works, is now, in consequence of the transfer of that Division to Ault & Wiborg Corporation, a member of the technical staff of the latter organization.

Dr. Burgess, after taking degrees at the University of Toronto, started his professional career with duPont and Atlas Powder Co. in high explosive work, but has devoted 16 years to the lacquer field. As a member of the Ault & Wiborg Corporation, he will devote his time to sales service work on behalf of customers.

Verne C. Bidlack, Industrial Sales Manager for McCloskey Varnish Co.

Verne C. Bidlack has been appointed manager of Technical and Industrial Sales by the McCloskey Varnish Co. of Philadelphia. Mr. Bidlack is well known to the industrial trade, having spent many years contacting manufacturers during his connection with the O'Brien Varnish Co. of South Bend, Ind.

In 1930 he became General Production Manager for Brandran-Henderson Ltd. of Montreal, and more recently was associated with the Norfolk Paint & Varnish Co. of Norfolk Downs, Mass. Mr. Bidlack is also well known in the paint and varnish trade through his activity and association work. He served as the first president of the Montreal Paint & Varnish Production Club. He has also served on various committees of the Federation of Paint & Varnish production clubs and is the author of several books on paint, varnish and lacquers.

Mr. Bidlack is a graduate chemist from the University of Michigan and, because of his training and past experience, is particularly well equipped to help manufacturers of industrial products with their finishing problems.

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